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can tend to excite them, as public as possible. That which forms the subject of this paper, is as yet known to very few, and perhaps may have been the cause of the loss of many useful members of society, without being suspected.

Theory of the Detonation and Explosion of Gunpowder. By the author of the former paper.

Journal de Physique, tom. 55.

These two phenomena, which take place at the same instant, arise from different causes. The detonation is the noise that is produced by the combination of two parts of inflammable air, and one of oxygen gas.

The explosion, or discharge, is produced by the water of the nitre, and that which results from the decomposition of the two gasses, which being expanded by the fire, occupies fourteen thousand times the space it did before; and acts in the same manner as compressed air, to which its elasticity is restored, and the explosive effect of which is produced without detonation.

The inflammation of gunpowder by means of a spark, arises from the ignition of the nitre and brimstone.

The inflammable gas is produced by the decomposition of the charcoal; and the oxygen gas arises from part of the nitre, which is decomposed by the fire.

After the explosion of gunpowder, we find the inside of the gun-barrel coated with a mixture of alkaline sulphuret and charcoal not decomposed. This alkaline mixture attracts the moisture of the air, and forms a greasy coating within the barrel; and on dsicharging the piece, it kindles, and produces what is termed hanging fire. The barrel of a fowling-piece, therefore, should never be used a second day without cleaning.

Observations. The approach of the shooting season will render the contents of this paper interesting to many readers of the Magazine. The caution at the end will be found very useful, and may prevent many bad accidents.

Description of a process by which Potash and Soda may be metalized without the assistance of iron. By M. F. R. Curaudau.

Journal de Physique, Ap. 1808.

If, according to the process of Mr. Davy, potash and soda be metallic oxides, is it not more probable, that the prussic calcinations are simply the combination of this metal with charcoal? Such at least was my opinion, at the time of making my experiments, and it will appear now far it was well-founded, since I have accomplished the metallization of potash and of soda, by heating strongly the alkali with charcoal, a process which it is obvious ranks among the Prussic calcinations.

The metallization of potash or soda takes place with either of the two following mixtures, which succeed as well in stone retorts as in iron tubes; the first or second process may be employed indifferently. I prefer iron vessels, however, because they are more permeable to caloric, and less subject to fusion than the stone ware, particularly when the latter is penetrated with alkali; an inconvenience that prevents the operation from being continued to the end, which does not happen so frequently with iron.

Process the first.

Mix intimately four parts of animal charcoal, well powdered, with three of carbonate of soda, dried on the fire, without having been fused, and mix the whole with a sufficient quantity of linseed oil, but not so as to form a paste.

Process the second.

Take two parts of flour, and mix them intimately with one part of soda, prepared as in the preceding process, and add to this mixture as much linseed oil as it will bear without ceasing to be pulverulent.

Whatever be the kind of vessel employed to calcine this matter, and whether it be the first or second mixture, we must always begin with heating it gradually; but as soon as the matter is obscurely red, the fire may be increased, till a fine sky-blue light, surrounded with a greenish aureola, is perceived in the interior of the retort or iron tube. To this light will soon succeed a very copious vapour, which obscures all the interior of the vessel. This is the metal which is disengaged from the mixture. The fire must then be urged no farther, for at this temperature the retort begins to fuse; and if the iron resists better, it is because